A New *Setaria* (Gramineae: Paniceae) from Argentina

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ABSTRACT. *Setaria inopinata* Toolin, sp. nov., is described and illustrated, and a key is provided to separate it from similar species in the genus. Apparently, this caespitose perennial, which resembles *S. tenax*, occurs only in northwestern Argentina.

During the study of specimens of South American *Setaria* as part of a project to enumerate those species that occur in both North and South America, some specimens appeared to share a suite of distinctive characters that did not seem to fit any previously described species. Comparisons revealed that these specimens were easily separated from other *Setaria* taxa, and I here propose them to be elements of a new species.

Setaria inopinata Toolin, sp. nov. TYPE: Argentina. Juyjuy: La Mendieta, matas laxas, a lunda a orille del ferrocarill, 7 Feb. 1943, *L. R. Parodi 14573* (holotype, US 1865698, ex Herbario de L. R. Parodi; isotype(s), possibly at BAA not seen). Figures 1, 2.

Haec species *S. tenici* similis, sed ab ea spiculis ellipticioribus, lemmate supero apice marronino, rugoso non nitente, inflorescentiae aristis antrorse tantum hamatis, palea infera plus minusive pyriformi basi coriacea, quam palea supera angustiore brevioreque, distinguitur.

Perennial, caespitose, from a knotty base. Culms erect or geniculate, to ca. 1.2 m tall, scaberulous, hirtellous below the nodes, the nodes pubescent or glabrate with age. Sheaths rounded, glabrous or occasionally with pustulate-based hairs, the upper margins ciliate; at least some collars pubescent with stiff hairs on each side. Ligule of stiff hairs ca. 2–3 mm long. Blades flat, to ca. 30 cm long and 0.6–2.5 cm wide, tapering to the base or somewhat cordate, scabrous, occasionally pubescent, the apex setose-involute, usually spirally twisted when dried. Panicles less than 15 to ca. 30 cm long, ca. 1–2.5 cm wide (excluding awns), somewhat open, the branches ascending, the lower to 3 cm long; or panicles more contracted, the branches all ca. 1 cm long; axis and branches minutely scabrous-hirsute and densely pilose or hirsute. Pedicels short, scabrous-hirsute, each with a single antrorsely barbed awn to 2.5 cm long. Spikelets 2.0–2.3 × 1.7–2.0 mm, and 1.6–1.9 mm thick, glabrous, strongly gibbous, broadly ovate-elliptic; lower glume ca. ⅓ as long as the spikelet, not apiculate or scarcely so, 3–5-nerved; upper glume ½(⅔) the spikelet length, broad and rounded, 5–7-nerved, at most slightly apiculate; lemma of lower floret short-apiculate, 5–7-nerved, equaling the spikelet, often only the middle and lateral nerves fully developed, thus appearing 3-nerved; palea of lower floret to ¾ the length of the upper palea, usually pyriform, the base broad, commonly coriaceous, brownish, narrowed to a hyaline upper part, with margins occasionally slightly thickened; the upper part may be only somewhat narrower than the lower (as in the type specimen), but the two parts apparently generally of different texture. Lemma of upper (fertile) floret 1.9–2.2 × 1.6–1.9 mm, and 1.5–1.8 mm thick, strongly gibbous, broadly ovate-elliptic, light to dark brown, the apex often becoming suffused with maroon at maturity, finely and evenly rugose, the cross-wrinkles slighty less pronounced toward the shortly apiculate, downturned apex; inrolled margins of the lemma (grasping the palea) are rather broad and somewhat flattened. Stamens 3, yellow. Stigmas 2, dark red.

The peculiar palea of the lower floret of *Setaria inopinata* is almost unique in the genus (at least among American species). A similar palea has been described for *S. pflanzii* Pensiero from northern Argentina and southern Bolivia (Pensiero, 1999), which is otherwise quite unlike *S. inopinata*. In *S. pflanzii*, e.g., the rachis is glabrous, the spikelets are 3 mm or more long, the upper glume is equal or subequal to the fertile lemma and 9–10-nerved, and the fertile lemma is nearly smooth and is shiny. I am not aware of other American species possessing sterile paleas with such marked textural diffences between the basal and upper portions. The question arises as to whether the peculiar paleas of these two species result from pathogenic infection, but at least as far as fungal activity is involved, tests were negative for *S. inopinata* (R. L. Gilbertson, pers. comm. 1997).

Setaria inopinata has gone undescribed even though specimens have been examined by such competent agrostologists as L. Parodi, S. Venturi, T. Stuckert, A. Hitchcock, A. Chase, and J. Pensiero. Nearly all the specimens I have seen have labels

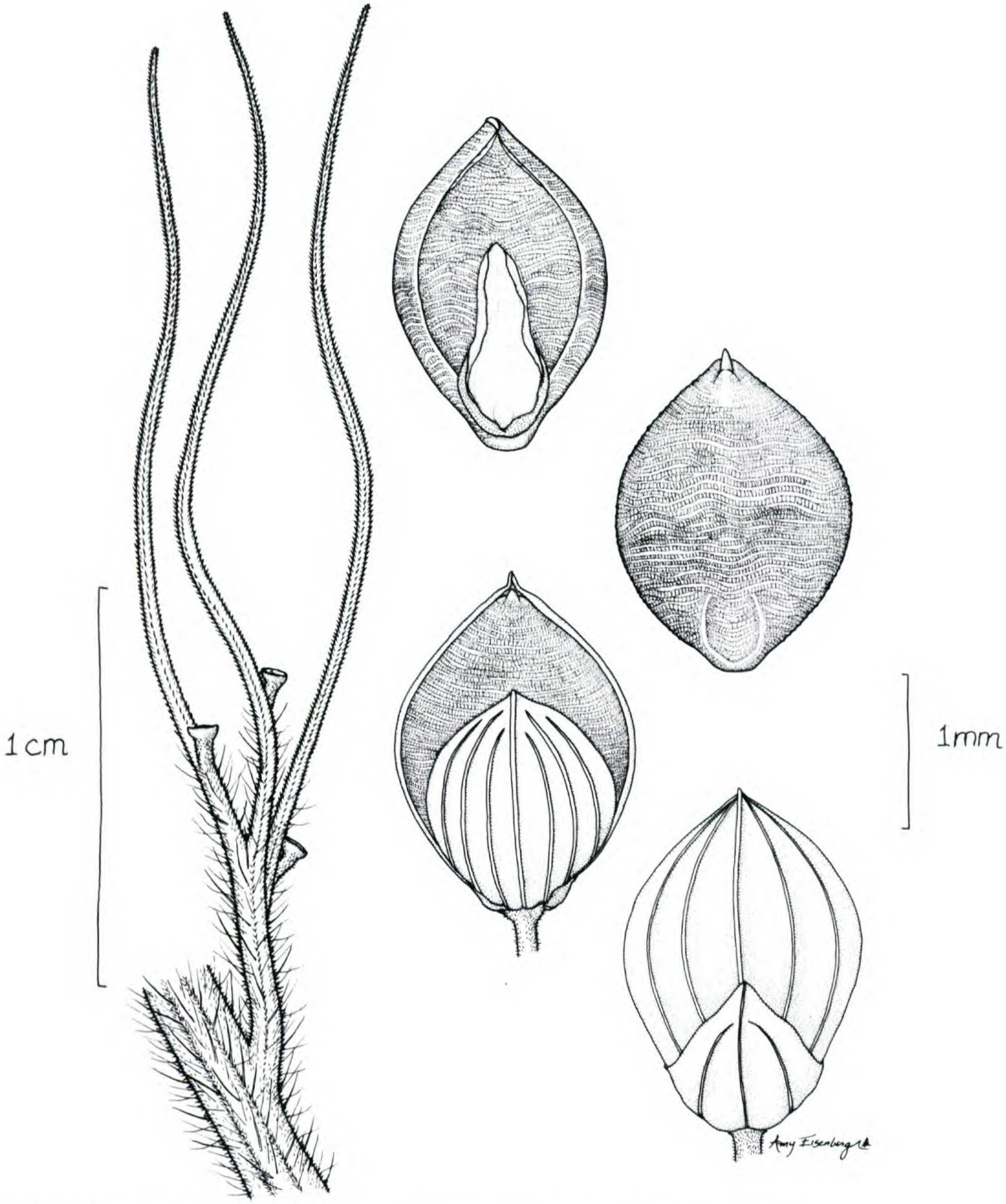

Figure 1. Details of the spikelets and florets of the type of *S. inopinata* Toolin (*Parodi 14573*).

originally bearing only the generic name. Various species names were often added by later workers. It seems astonishing that this distinctive taxon has escaped recognition for so long, and thus its specific name, which means "surprising." Part of the foregoing lack of recognition appears to have been due in some part to the confusion of various species among earlier South American agrostologists (see Toolin & Reeder, 2000). More recently, *S. inopinata* has had the name of a different species misapplied to it.

All specimens of *Setaria inopinata* I have seen were collected in northwestern Argentina. Flowering occurs from November to March.

As in many other members of subgenus *Setaria* Rominger (Rominger, 1962), *S. inopinata* can exhibit considerable morphological variation in vegetative parts and in panicle size and shape. Such

Figure 2. Photograph of the type specimen of *S. inopinata* (*Parodi 14573*).

variations are probably due to environmental conditions during growth and reproduction. In habit and gross morphology, *S. inopinata* most closely resembles *S. tenax* (Richard) Roemer & Schultes, and to a lesser extent, *S. scabrifolia* (Nees) Kunth, and robust forms of *S. macrostachya* HBK, but differs in significant details. *Setaria pflanzii* is rather more distinct from the others. The following key will serve to separate the five species.

1a. Lemma of upper floret entirely shiny and obscurely rugose; panicle axis glabrous; upper glume equal or subequal to the upper lemma; spikelets 2.8–3 mm long . . . . . *S. pflanzii*
1b. Lemma of upper floret entirely rugose and not shiny, or only the apex smooth and shiny; panicle axis ± pubescent; upper glume ¾ or less as long as the upper lemma; spikelets 2.4 mm long or less.
  2a. Apex of upper floret lemma not rugose, more or less smooth, shiny; palea of lower floret as broad and long as upper floret palea, with widely infolded margins.
    3a. Upper glume ca. ½ the length of upper lemma; awns with both antrorse and retrorse barbs . . . . . *S. tenax*
    3b. Upper glume ca. ¾ the length of the upper floret lemma; awns with antrorse barbs only . . . . . *S. scabrifolia*
  2b. Upper lemma entirely rugose, apex never smooth and shiny; lower palea narrower than the upper floret palea, the margins not widely infolded.
    4a. Collars bearing stiff hairs ca. 1 mm long, becoming glabrate; panicle axis densely hirsute or somewhat pilose, the hairs ca. 1 mm long; upper glume ca. ¾ the length of the upper floret lemma; lemma tan to brown, upper part usually suffused with maroon at maturity; palea of lower floret ± pyriform and coriaceous at base . . . . . *S. inopinata*
    4b. Collars glabrate or with minute, curly hairs; panicle axis not densely hairy, bearing scattered villous white hairs (2)3(4) mm long; upper glume ⅔ the length of the upper lemma; lemma greenish white to tan, apex never suffused with maroon; palea of lower floret lanceolate-oblong, never coriaceous at base . . . . . *S. macrostachya*

Specimens at NY and US of what I propose as *Setaria inopinata* were annotated as *S. macrostachya* by J. Pensiero. I do not know the basis for Pensiero's annotations to *S. macrostachya*. It appears from his published descriptions (1988, 1999) that he has been consistently misapplying the name *S. macrostachya* HBK to the species herein described as new. In addition to the characters in the key above, *S. macrostachya* differs in having fertile lemmas consistently narrower and thinner relative to length. In *S. macrostachya*, the averaged width; thickness; length values (for over 100 specimens) are 1.5; 1.5; 2.1 mm, while in *S. inopinata* averaged values (for ca. 35 specimens) are 1.6; 1.7; 2.1 mm, respectively. Although Pensiero (1999) gave the width of "*S. macrostachya*" (*S. inopinata*) lemmas as "1.2–2 mm lat.," I have found only one or two lemmas as narrow as 1.3 mm, and very few as narrow as 1.4 mm wide, about 90% being 1.5–1.8 mm. These differences may be attributed to the occasional extreme in Pensiero's larger sample, and need not be critical. Pensiero (1988: 374) indicated that he had seen "fragmentos del holotipo" of *S. macrostachya* at BAA; if those fragments consisted solely of spikelets, then a misconception might have arisen some time after he saw those fragments, since the spikelets of the two species are roughly similar at first glance, both being notably gibbous. I emphatically point out that Pensiero's description is very different than Rominger's description of *S. macrostachya* HBK, in the standard work on North American *Setaria* (Rominger, 1962), which Pensiero has cited (1988, 1999). I will be providing specimens of *S. macrostachya* HBK (that I have compared to type fragments (US) of that species) to various South American herbaria so that a clear concept of that species may be gained by South American agrostologists.

Paratypes. ARGENTINA. **Chaco:** Villa Angela, Feb. 1940, *Boffa s.n.*(NY); Las Buenas, entre grannas[?] en los cercos, 24 Feb. 1930, *Venturi 10174* (GH, NY, US). **Formosa:** Laishi, Mar. 1918, *Jörgensen 2414* (GH). **Juyjuy:** San Pedro de Juyjuy, 12 Apr. 1945, *O'Donnell 3053* (NY); Dept. Capital, Arroyo Palo Mercado, 23 Jan. 1976, *Cabrera et al. 27505* (US); La Mendieta, 11 July 1945, *Parodi 14578* (US); Dept. Capital, Rio Lali, 12 Dec. 1923, *Venturi 2259* (US). **Salta:** Dept. Capital, La Merced, 26 Feb. 1949, *Legname 474* (US); Dept. Candelaria, Agua Caliente, 26 Feb. 1925, *Venturi 3696* (US); Dept. Salta, Rosario de la Frontera, 29 Jan. 1935, *Carbone 767* (GH); Dept. Cerillos, Cerillos, 2 Feb. [19]41, *Meyer 3583* (GH); Ledesma, 27 Apr. 1927, 30 Enero 1916, *Spegazzini 1088* (US); Cerro San Bernardino, 6 Feb. 1940, *Parodi 13497, 13499, 13505* (US). **Tucumán:** Dept. Leales, Las Encrucijades, 24 Feb. 1941, *Ousset 56* (NY), *53* (GH); Dept. Burrujacú, Cerro de Campo, Mar. 1918, *Bailetti 309* (GH); Dept. Leales, La Rioja, 4 Feb. 1940, *Castellanos s.n.* (GH); Dept. Leales, Chanar Pozo, Nov. 1919, *Venturi 626* (GH, K, US); Tapia, Hab. rozadas, 29 Dec. 1911, *Rodrigues 253* (US); Dept. Capital, Capital, 15 Mar. 1910, *Lillo 10081* (US); Dept. Trancas, Tapia, 30 Dec. 1923, *Venturi 2341A, 2343* (US); Dept. Cruz Alta, Estación Araoz, 6 Jan. 1926, *Schreiter 4496* (US).

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made the drawing in Figure 1, and John Amato provided the photo in Figure 2.

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